Estimating PCB Contamination in Soil and Sediment along the Kalamazoo River: 12th St. Landfill

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The Kalamazoo River is located in southwest Michigan and flows west into Lake Michigan. Many former paper mills and paper residual disposal areas are located along this stretch of river. From the late 1950s to the 1970s, paper processes that involved carbonless copy paper produced waste that contained PCBs. Because of the close proximity of the paper facilities to the Kalamazoo River, PCB contamination was and continues to be widespread in and around the river. This PCB contamination poses a significant ecological and human health risk. A large stretch of the Kalamazoo River and surrounding floodplains and wetlands has been designated as the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund site. Because of its magnitude, the site has been divided into several operable units. One of these units is the 12th St. Landfill. The 12th St. Landfill is located along the Kalamazoo River in Allegan County, Michigan, about 1.5 miles northwest of the city of Plainwell. The landfill contains PCB-contaminated paper residuals and is a source of PCBs to the Kalamazoo River, floodplains, and wetlands.

The issue of PCB contamination at the 12th St. Landfill has been addressed through sampling and analysis of soils and sediments at the site. Initially, a sample design was created using the US EPA FIELDS tools, and samples were collected at specific locations and depths around the landfill. The precise sample location was recorded using global positioning system (GPS) equipment, and each sample was tested for PCBs. The first goal of the analysis was to gain a better understanding of where the PCB contaminants were located and the degree of contamination at the site. To do this, the US EPA FIELDS tools for ArcView, a geographic information system (GIS), were used to estimate both the mass and volume of PCBs in the soil and sediment surrounding the landfill. In addition, maps were created to show the estimated PCB concentration at specific soil depths and locations. The second goal of the analysis was to develop a strategy for remediation at the site. Once the extent of contamination was estimated, a range of possible cleanup action levels was chosen. Maps and charts were created to show how much soil and sediment would need to be removed at a given action level. The costs and benefits of various action levels can be compared so that an appropriate decision regarding the cleanup of the site can be made.

The analysis of PCB contamination at the 12th St. Landfill is an important step in trying to reduce the ecological and human health risks along the Kalamazoo River. The use of mapping and GIS help to more clearly illustrate the magnitude of the problem at the site and the various options for remediation. In addition, the results of the analysis act as a resource for decision makers and responsible parties by providing technical information in a straightforward, easy-to-use format.